

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

December 14, 2010

Precipitation and Snowpack

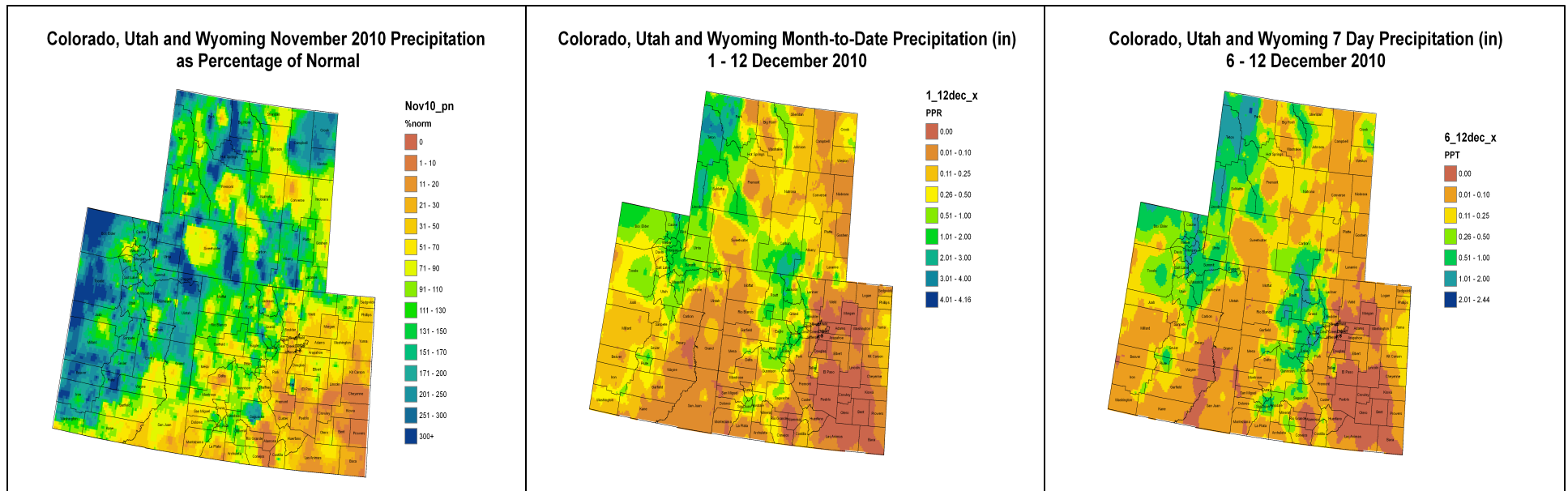


Fig. 1: November precip as percent of ave.

Fig. 2: December month-to-date precip in inches.

Fig. 3: December 6 – 12 precip in inches.

For the month of November, the northwestern portion of the Upper Colorado River Basin (UCRB), in Utah and Wyoming, received the most precipitation while the eastern plains of Colorado, the Rio Grande basin, and the four-corners region were abnormally dry (Fig. 1). For the first half of December, ample amounts of precipitation have continued to fall in the north central mountains of Colorado and along the western edges of the Upper and Lower Green River basins (Fig. 2).

Last week, the eastern plains of Colorado (and into the Rio Grande basin) received very little to no precipitation (Fig. 3). The north central mountains of Colorado received over an inch of moisture in some spots. Amounts in the Upper and Lower Green River basins ranged from a quarter of an inch to over an inch, while western Colorado and eastern Utah received less than a tenth of an inch for the week.

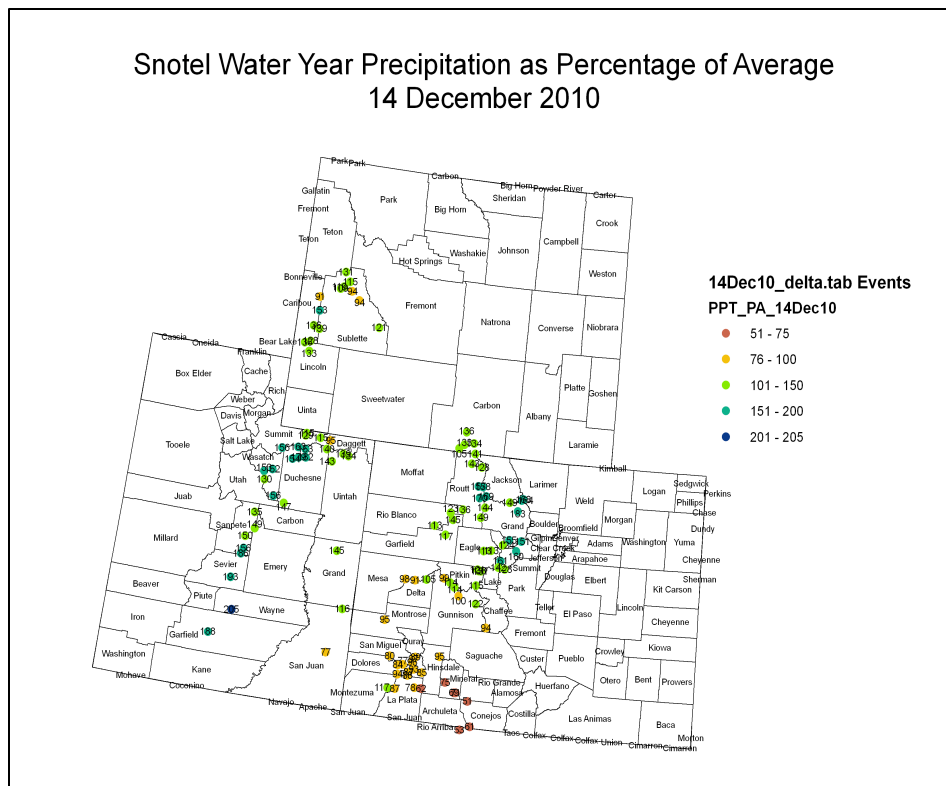


Fig. 4: SNOTEL WYTD precipitation percent of average.

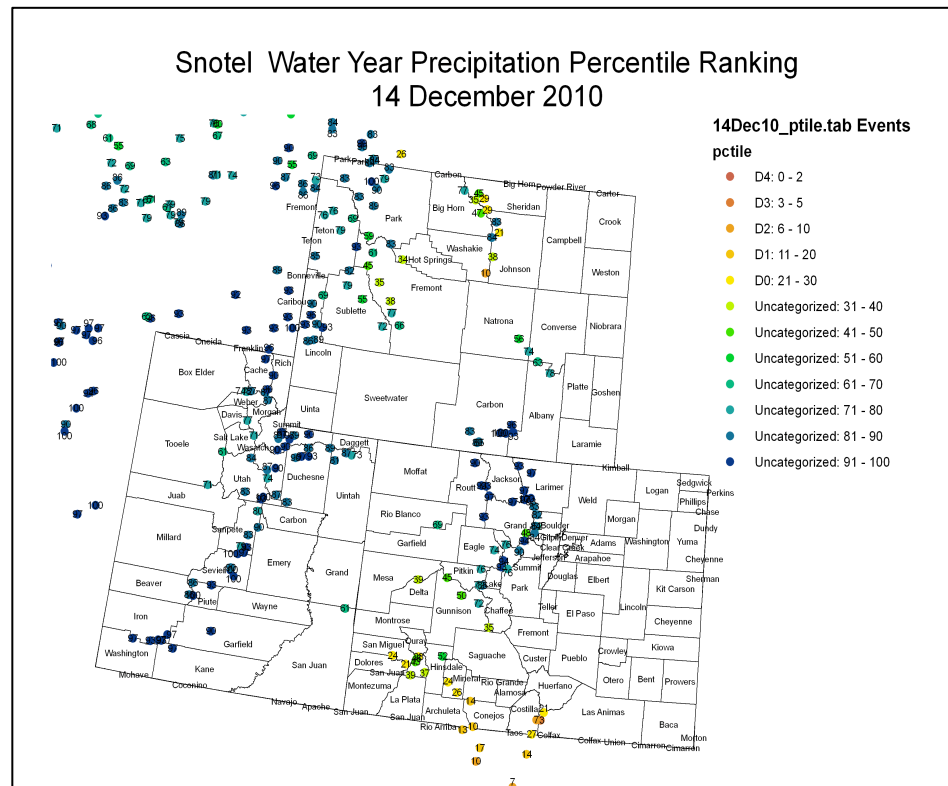


Fig. 5: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

SNOTEL water-year-to-date (WYTD) precipitation percents of average increased over the past week near the Colorado headwaters region and in the Upper Green River basin, while decreases were seen in Utah and southern Colorado. For the water year, most of the UCRB is showing precipitation above 100% of average (Fig. 4), with the exception of southwestern Colorado which shows a range of around 50 – 80% of average.

Precipitation percentile rankings for the SNOTEL stations around the UCRB show most stations ranked fairly high (Fig. 5). In the Rio Grande and San Juan basins, many sites are showing percentile rankings of less than 30%, meaning that only 30% of the time has the station experienced a drier start to the water year. For most of the sub-basins in the UCRB, snowpack is over 100% of average for the water year. The San Juan basin is the driest basin, with snowpack at 51% of average. For the entire UCRB above Lake Powell, snowpack is currently at 102% of average.

Streamflow

As of December 12th, about 83% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 6). Though an increasing number of streams have frozen over, the majority of gages still recording show good 7-day average flows for this time of year. There are several gages around the Duchesne River in UT recording below normal flows.

Looking at hydrographs around the UCRB, key sites are showing near normal discharges and look pretty good in terms of seasonal flow conditions (Fig. 7). 7-day average discharge on the Colorado River at the CO-UT state line and on the San Juan River near Bluff, UT are at 86% and 88% of normal, respectively. The Green River near Green River, UT experienced a strong upsurge in flows this past week and is now at 145% of normal. All three gages show 7-day average discharge within the normal percentile range, though all show below normal cumulative runoff for the calendar year.

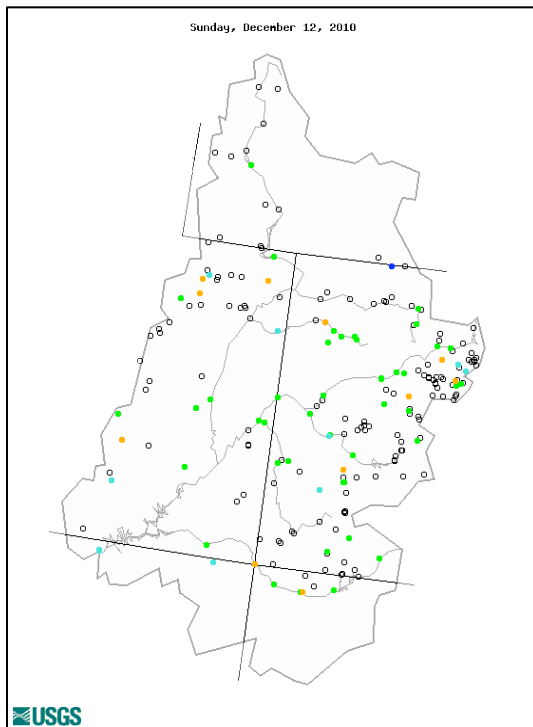
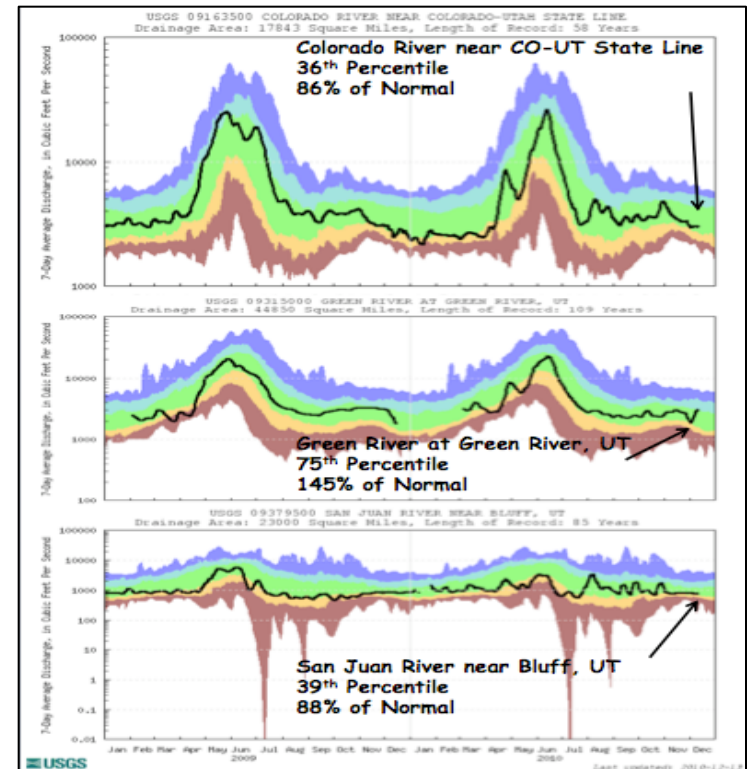


Fig. 6: USGS 7-day average streamflow compared to historical streamflow for December 12th in the UCRB.

Fig. 7: USGS 7-day average discharge over time at the CO-UT state line (top), Green River, UT (middle) and Bluff, UT (bottom).



Water Supply and Demand

Another week of warmer than average temperatures prevailed throughout the UCRB and surrounding areas. Temperatures were particularly warm (more than 9°F above average) over northwest CO and southwest WY, with the rest of the basin around 3° to 6°F warmer than average for this time of year. Soil conditions have remained unchanged over the past week (Fig. 8) with dry soils showing up in eastern Colorado and near the four-corners and good soil conditions in the mountains of CO and UT.

Only minor decreases in storage amounts were seen in the reservoirs throughout the basin for the last week, with Blue Mesa and Lake Granby seeing slight increases in storage since December 1st. Blue Mesa, Flaming Gorge, Navajo Lake and Lake Granby are all above average for this time of year. Lake Powell's storage has decreased by 161,000 acre feet since December 1st (with projected releases for the month of around 845,000 acre feet). Lake Powell is currently at 78% of average for this time of year and around 60% of capacity.

Precipitation Forecast

Benign weather over the UCRB will gradually give way to more unsettled conditions towards the end of the week. A strong jet stream will carry moisture over the region beginning on Wednesday morning, but do not expect the snow to really ramp up in the basin until Thursday. Snow will initially be heaviest in the northwestern portion of the basin and the central mountains. Activity will shift south into the northern San Juans by late day Thursday where QPF fields are generating around 0.75 inches of liquid precipitation through Friday. Decent snow is also possible in and around the front range of southern Colorado—providing relief in areas that have been very dry lately. Another chance of precipitation will come later this weekend as models continue to show more energy making its way onshore throughout this weekend and into early next week.

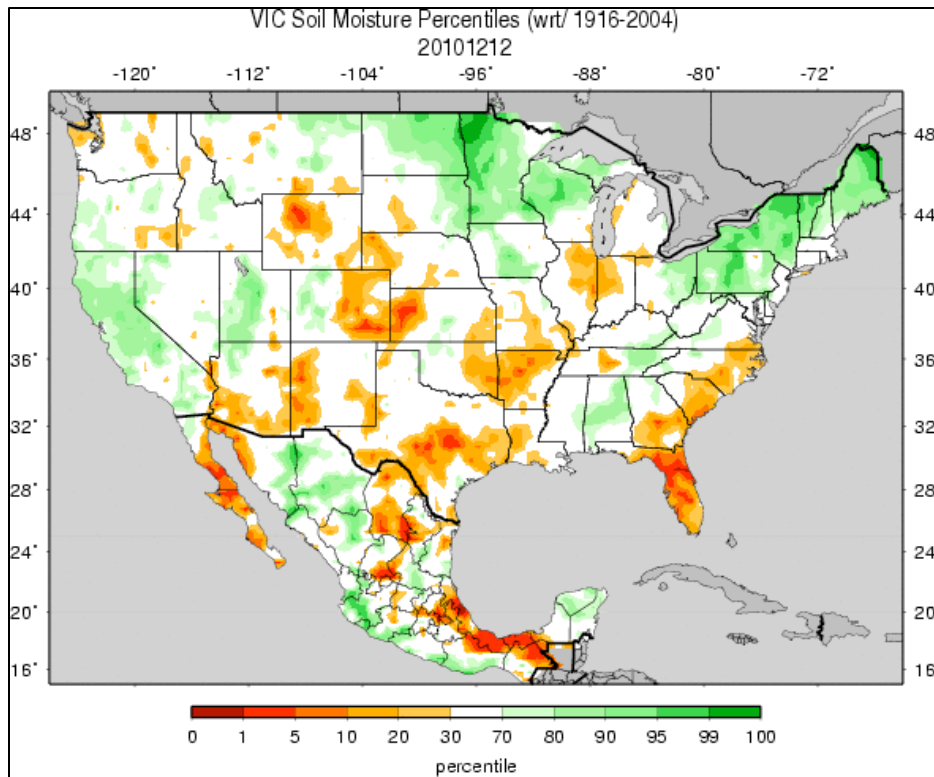


Fig. 8: VIC soil moisture percentiles as of December 12th.

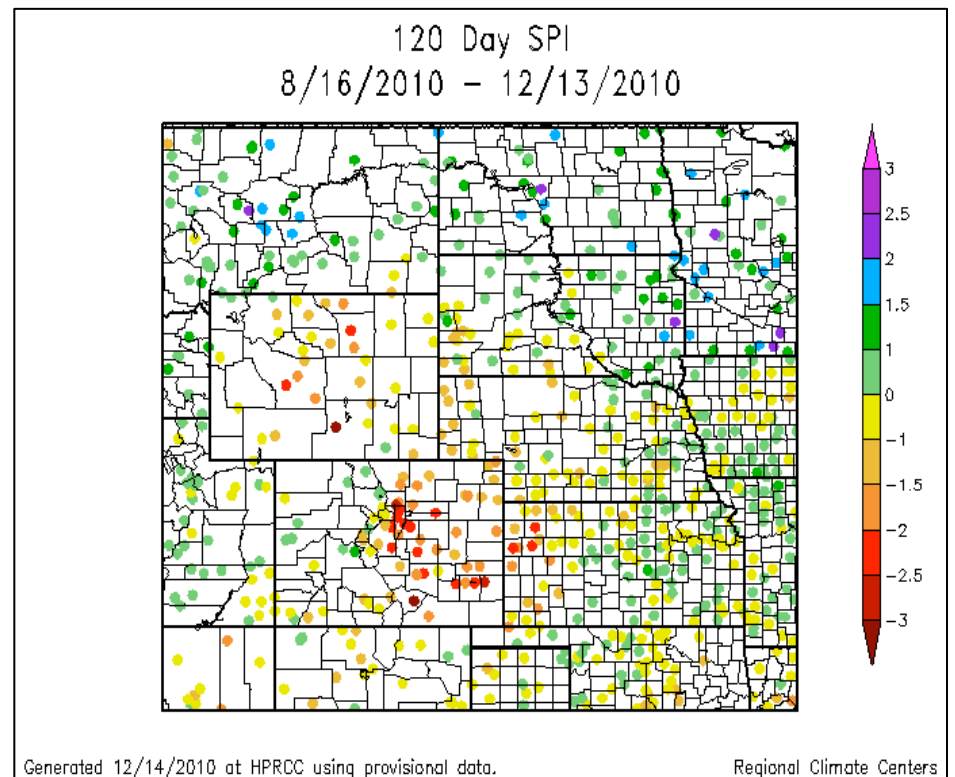


Fig. 9: 120 day standardized precipitation index as of December 13th.

Drought and Water Discussion

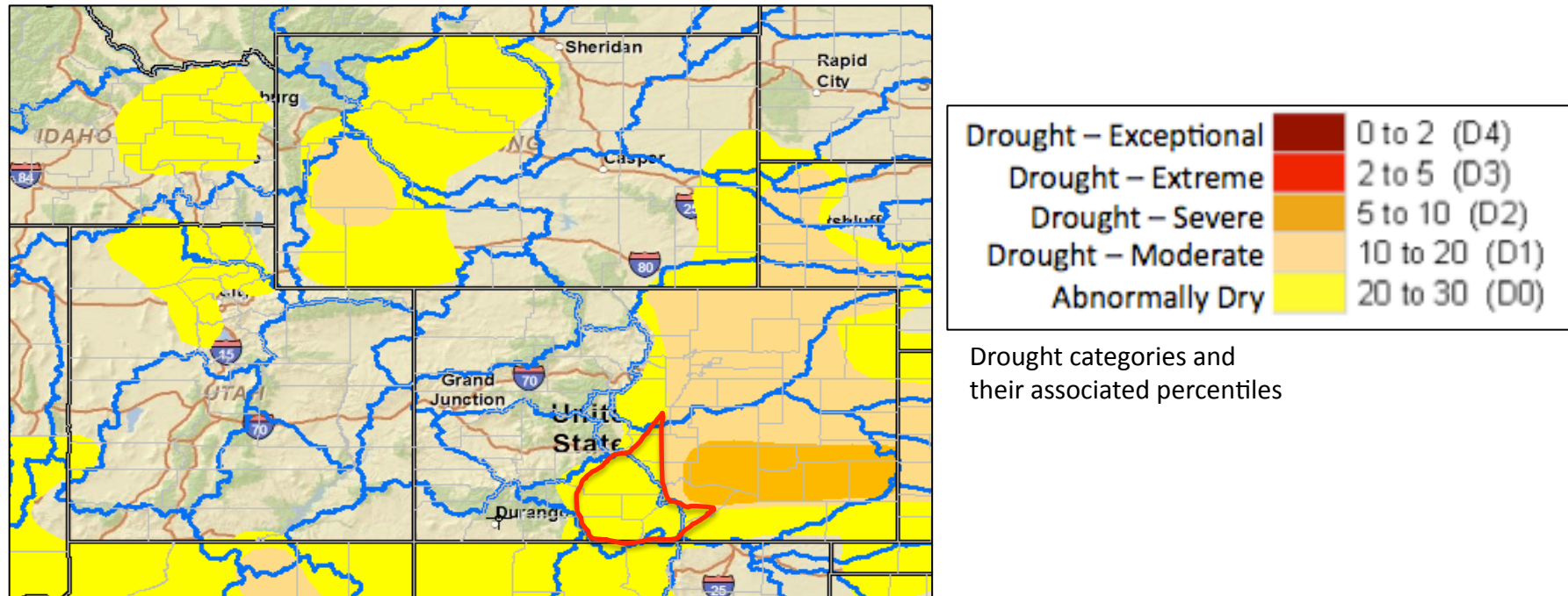


Fig. 10: December 7th release of U.S. Drought Monitor for the UCRB

Several suggestions have been made for changes to the current U.S. Drought Monitor (USDM) map (Fig. 10). The first suggestion was to expand D2 northward along the Colorado front range. Short term and long term SPIs show large deficits there (Fig. 9) and soil conditions are very dry. However, it has been argued that these conditions are not so abnormal to warrant D2 yet; also with the possibility of precipitation in the area within the next week, status quo is being recommended for that area.

It has also been suggested that D1 be expanded into the Rio Grande basin in southern Colorado (Fig. 10, red line). Though SPIs in the region aren't as bad as eastern Colorado, the basin has experienced precipitation deficits for the past several months and SNOTEL precipitation percentile rankings are fairly low. An expansion of D1 into Las Animas and Baca counties in southeastern Colorado was suggested, and the USDM author has already included this in the first draft of the map. The USDM author also removed minor amounts of D0 from western Wyoming.